

CLAIMS

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1 In a Wye-connected electrical system for supplying power from an AC  
2 source to at least one nonlinear load connected to a phase line therein, a device for  
3 substantially eliminating currents in the neutral wire generated by the nonlinear  
4 load, said device comprising:

5 an electrical circuit comprising

6 a first passive electrical component connected in series  
7 between the AC source and the nonlinear load,

8 a second passive electrical component connected in parallel to  
9 said first passive electrical component,

10 a third passive electrical component connected in parallel to  
11 said first and said second passive electrical components; and

12 wherein said first, said second, and said third passive electrical components  
13 of said circuit are tuned to a harmonic frequency of a fundamental frequency of the  
14 AC source so as to substantially eliminate a harmonic current drawn by the  
15 nonlinear load.

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1 A device as recited in claim 1, wherein:

2 said first, said second, and said third passive electrical components are tuned  
3 to a third harmonic frequency of the AC source.

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1 A device as recited in claim 1, wherein:

2 said first passive electrical component comprises a capacitor;

3 said second passive electrical component comprises a reactor; and

4 said third passive electrical component comprises a resistor.

1 A device as recited in claim 2, wherein:  
2 said first passive electrical component comprises a capacitor;  
3 said second passive electrical component comprises a reactor; and  
4 said third passive electrical component comprises a resistor.

1 A harmonic current eliminating device as recited in claim 1, wherein:  
2 each phase line in the electrical system is connected to at least one nonlinear  
3 load;  
4 said device comprises a plurality of said electrical circuits, each of said  
5 electrical circuits being connected along a separate phase line therein and in series  
6 with at least one nonlinear load so as to substantially eliminate a harmonic current  
7 drawn thereby; and  
8 wherein each of said electrical circuits is tuned to an identical harmonic  
9 frequency of the AC source.

1 A harmonic current eliminating device as recited in claim 2, wherein:  
2 each phase line in the electrical system is connected to at least one nonlinear  
3 load;  
4 said device comprises a plurality of said electrical circuits, each of said  
5 electrical circuits being connected along a separate phase line therein and in series  
6 with at least one nonlinear load so as to substantially eliminate a harmonic current  
7 drawn thereby; and  
8 wherein each of said electrical circuits is tuned to a third harmonic of the AC  
9 source.

1 A device for substantially eliminating a harmonic current generated by a  
2 nonlinear load in an electrical distribution system, the distribution system  
3 distributing power from an AC source, said device consisting of:

4 a first passive electrical component connected in series with the nonlinear  
5 load;

6 a second passive electrical component connected in parallel to said first  
7 passive electrical component;

8 a third passive electrical component connected in parallel to said first and  
9 said second passive electrical components; and

10 wherein said first, said second, and said third passive electrical components  
11 are tuned to a harmonic frequency of the AC source so as to change the current  
12 drawn by the nonlinear load.

1 A device as recited in claim 7, wherein:

2 said device is tuned to a third harmonic frequency of the AC source.

1 A device as recited in claim 7, wherein:

2 said first passive electrical component is a resistor;

3 said second passive electrical component is a reactor; and

4 said third passive electrical component is a capacitor.

1 A device as recited in claim 8, wherein:

2 said first passive electrical component is a resistor;

3 said second passive electrical component is a reactor; and

4 said third passive electrical component is a capacitor.

1 A device for substantially eliminating harmonic currents in an electrical  
2 system having a nonlinear load and an AC source, and increasing the operational  
3 range of the nonlinear load, comprising:

4 a first passive electrical component connected in series with the nonlinear  
5 load;

6 a second passive electrical component connected in parallel to said first  
7 passive electrical component;

8 a third passive electrical component connected in parallel to said first and  
9 said second passive electrical component;

10 wherein said first, said second, and said third passive electrical components  
11 are tuned to a third harmonic frequency of the AC source so as to substantially  
12 alter current drawn by the nonlinear load.

1 A device as recited in claim 11, including:

2 a housing for said first, said second, and said third passive electrical  
3 components; and

4 an equipment rack panel member connected to said housing so as to mount  
5 said housing in an equipment rack storing the nonlinear load; and

6 wherein said equipment rack panel member is substantially perforated so as  
7 to allow airflow to pass therethrough.

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1 A device as recited in claim 11, including:  
2 an electrical housing member;  
3 at least one electrical socket for connecting to the nonlinear load, said socket  
4 being disposed along a first surface of said housing member; and  
5 at least one bracket member for mounting said device along a substantially  
6 planar surface so that said socket and said first surface of said housing member are  
7 substantially aligned with said planar surface, said device substantially replacing a  
8 conventional wall outlet.

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1 A device as recited in claim 11, wherein:  
2 the nonlinear load comprises a computer having a monitor connected  
3 thereto; and  
4 said device further includes at least one monitor saver board, said monitor  
5 saver board deactivates said monitor during periods of nonuse, and a housing  
6 member having electrical connectors for connection to said monitor and to said  
7 computer.

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1 A device as recited in claim 11, further including:  
2 an isolation transformer;  
3 a housing member having electrical connectors extending therefrom for  
4 providing connection to the nonlinear load; and  
5 at least one bracket member for attaching said housing member to a utility  
6 cart.

1 A device as recited in claim 15, wherein:  
2 said isolation transformer is a hospital grade isolation transformer; and  
3 the nonlinear load comprises electronic hospital equipment and said bracket  
4 member attaches said housing member to a hospital utility cart, said cart holding  
5 said electronic hospital equipment.

1 A device as recited in claim 11, including:  
2 means, connected in series with said parallel combination of said first, said  
3 second, and said third passive electrical components, for clamping current levels  
4 drawn by the nonlinear load, comprising a current clamping circuit, a sensor for  
5 detecting a rapid rise in current drawn by the nonlinear load and means for  
6 automatically deactivating said clamping circuit based upon signal levels detected  
7 by said sensor.

1 A device as recited in claim 17, wherein:  
2 said first, said second, and said third device are tuned to a third harmonic  
3 frequency of the AC source.

1 A device as recited in claim 18, wherein:  
2 said current level clamping circuit maintains a maximum current level drawn  
3 by the nonlinear load to between approximately 6 and 8 amps; and  
4 the nonlinear load includes a heating unit.

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